1.0 Examiner's Rejections and Applicants' Responses under 35 USC 112

1.1 Examiner's Rejections of Claims 12-23 under 35 USC 112

The Examiner rejects claims 12-23 under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The Examiner states that "there is no positive recitation of a control means having a means for detecting an occurrence of a break in the mud cake seal. Appropriate correction and or explanation are needed".

1.2 Applicant's Response to Rejection of Claims 12-23 under 35 USC 112

Explanation of support for the term "control means" in the application as filed is provided as follows.

The term "control means" finds support as "control electronics 45". The term "control electronics 45" appears in paragraph 0033, of the application as filed, in the sentence "Downhole programmable control electronics 45 controls the sequencing and timing of the steps of the method by timing measurements from pressure sensor 36 and by controlling pretest piston pump 23". (This sentence was moved to paragraph 0034 in Amendment A, dated 8/1/05).

The steps of the method of a preferred embodiment are illustrated in FIG. 1 of the application as filed. The steps of FIG.1 are discussed in paragraphs 0012 and 0032-0036 of the application as filed. The steps of FIG.1 include step 114: "detecting a break in mud cake seal". Therefore control electronics 45 includes "control means for detecting a break in the mud cake seal" because control electronics 45 "controls the sequencing and timing of the steps of the method" (paragraph 0033, lines 6-7), and one of the steps is step 114, "detecting a break in mud cake seal".

Accordingly, the phrase "control means having a means for detecting an occurrence of a break in the mud cake seal" finds support in the application as filed.

2.0 Response to Examiner's Reasons Why Arguments Filed 8/3/05 are not Persuasive

2. 1 Arguments in Amendment A deemed not Persuasive for Claims 1 and 2

The Examiner rejects claim 1 and 2 under 35 USC 103 based, at least in part, on a statement, relating to claim 2, in Amendment A, under Remarks, in the first sentence of the first paragraph of section 5.4, on page 11.

Applicants now recognize that the above-mentioned sentence is incorrect as a result of a proofreading oversight that was unintentional. Applicants intent was to assert additional novelty in claim 2, over that in claim 1, by arguing in a single sentence: "Even if, as stated by the Examiner, 'Proett et al. disclose where detecting the break in the mud cake seal includes measuring cavity pressure and detecting an abrupt change associated with cavity pressure', Proett et al. do not use 'detecting the break in the mud cake seal' to initiate anything". In fact, Proett et al. do not disclose where "detecting the break in the mud cake seal includes measuring cavity pressure and detecting an abrupt change associated with cavity pressure", and saying otherwise is inconsistent with the entire prosecution record, including section 5.2 of Amendment A. So the above-mentioned sentence, being inconsistent with the prosecution record, is clearly incorrect. It is also, unintentionally, misleading.

It is respectfully requested that the Examiner eliminate from consideration the above-mentioned sentence as being evidently incorrect and misleading. It is believed that after this sentence is eliminated from consideration, claims 1 and 2 are in condition for allowance.

2.2 Arguments in Amendment A deemed not Persuasive for Claim 13

The Examiner rejects claim 13 under 35 USC 103 on the grounds that it is well known that most systems are driven electromechanically.

It is believed that after the above-mentioned incorrect and misleading sentence is eliminated from consideration, claim 12 is in condition for allowance. Therefore claim 13 is in condition for allowance, as being dependent on claim 12.

3.0 Examiner's Claim Rejections under 35 USC 103

The Examiner rejects claims 1, 2, 7, 10-13 and 16 under 35 U.S.C. 103(a) as being unpatentable over Proett et al. ('076) in view of Proett et al. ('286).

3.1 Applicant's Response to Rejection of Claim 1 under 35 USC 103

In rejecting claim 1 under 35 U.S.C. 103, the Examiner asserts that Proett et al. ('076) disclose "detecting an occurrence of a break in the mud cake seal (Column 2)", and that Proett et al. ('286) disclose, at column 9, lines 1-10, "holding constant the volume of the cavity immediately after detecting the occurrence of the break in the mud cake seal, for a sufficient build-up period to establish pressure equilibrium between cavity fluid and formation fluid".

In response, Applicants present below the prior art teachings of Proett et al. ('076), copied, in pertinent part, from column 2, lines 8-65, and the prior art teachings of Proett et al. ('286), copied from column 9, lines 1-10.

Proett et al. ('076) Teach, in Part

With this type of knowledge, formation testing tools ("formation testers") maybe used to predict the pressure of an oil bearing formation around a well, and to thereby better understand the oil's mobility. In a typical formation testing operation, a formation tester 200 is lowered into a wellbore 202 with a wireline cable 201, as illustrated in FIG. 2A.

**

After the formation tester 200 is lowered to the desired depth of the wellbore 202, along with any other equipment connected to the wireline cable 201, pressure in a flow line 219 is equalized to the hydrostatic pressure of the wellbore by opening an equalization valve 214.

**

Then, a pressure sensor 216 may be used to measure the hydrostatic pressure of the drilling fluid.

**

Fluid from the formation 222 is drawn into the tester 200 by mechanically retracting a pretest piston 218. The retracting of the protest piston 218 creates a pressure drop at the probe 212, thereby drawing formation fluid into the probe 212, the flow lines 219, and a protest chamber 220.

**

When the piston 218 stops retracting, formation fluid continues to enter the probe 212 until the pressure differential between the chamber 220 and the formation 222 is minimized.

**

During the process described above, a number of measurements may be taken. "Drawdown pressure", for example, corresponds to the pressure detected by the sensor 216 while formation fluid is being withdrawn from the formation.

Proett et al. ('286) Teach, in Part

As these fluids enter and fill the tester 10, the pressure detected by the sensor 50, as shown by the curve portion 106, rises to p_{bu} which approaches equilibrium with the formation pressure. This final buildup pressure p_{bu} is frequently referred to as the "sandface pressure." It is usually assumed that the sandface pressure is close to the formation pressure. This equilibrium marks the close of the buildup phase of the test.

Proett et al. ('286) Do Not Disclose or Suggest

Applicants note that Proett et al. ('076), in column 2, does not disclose or suggest "detecting an occurrence of a break in the mud cake seal". There is no mention in Proett et al. ('076), in column 2, or elsewhere in the cited reference, of "detecting an occurrence of a break in the mud cake seal". Proett et al. ('076), at column 8, lines 62-66, recites

In task 906a, the instantaneous pressure derivative between t.sub.4 and t.sub.5 is determined. Pressure measurements during this period contain information related to the flowline fluid compressibility which is needed to calculate both mudcake and formation permeability.

Thus, Proett et al. ('076) uses abrupt pressure change ("pressure derivative") only to calculate flowline fluid compressibility, and mudcake and formation permeability. So the term, "measuring drawdown pressure" in a pretest piston, as recited by Proett et al. ('076), does not equate to "detecting an occurrence of a break in the mud cake seal".

Applicants note that Proett et al. ('286), in column 9, lines 1-10, does not disclose or suggest "holding constant the volume of the cavity immediately after detecting the occurrence of the break in the mud cake seal" because column 9, lines 1-10, contains no such teaching,

and the Proett et al. ('076) teaching of "measuring drawdown pressure" is insufficient to disclose or suggest "detecting an occurrence of a break in the mud cake seal".

Proett et al. ('286) Teach Away

Applicants note that Proett et al. ('286), at column 8, lines 62-64, recites that "when the pressure within the tester 10 has been sufficiently reduced to the drawdown pressure P_{dd}, the pretest piston is stopped". In this statement, and by the phrase "READ DRAWDOWN DATA AND DETERMINE 1st AND Tdd" at 154 in the flowchart of FIG. 5, Proett et al. ('286) recites that, in one embodiment, the pretest piston is stopped, and the drawdown period is terminated at t(dd), when the pressure within the tester has been reduced to a predefined drawdown pressure P_{dd} (see FIGS. 3 and 4).

Applicants further note that he act of stopping the pretest piston "when the pressure within the tester 10 has been sufficiently reduced to the drawdown pressure P_{dd}", as recited by Proett et al. ('286), and the act of stopping the pretest piston "immediately after detecting the occurrence of the break in the mud cake seal", as claimed in claim 1, are mutually exclusive.

So Proett et al. ('286) teaches away from the invention of pending method claim 1.

Applicants further note that Proett et al. ('286), in column 7, line 66 through column 8, line 24, recites the problem of flow line storage effects. Proett et al. ('286), in column 2, line 66 through column 3, line 3, also recites

> Thus, traditional techniques use "late time data", i.e., data collected near the end of the buildup cycle, to estimate permeability and pressure, because the flow line storage effects distort the early time data and make it unusable by these techniques.

Proett et al. ('286), in column 15, lines 66-64, in column 16, lines 41-43, and in column 15, lines 41-42, also recites

> It should be noticed that the first buildup cycle is prematurely terminated before the final buildup pressure is permitted to stabilize, primarily because the first drawdown/buildup cycle is intended to clear the mudcake from the borehole wall to facilitate a second, more accurate, drawdown/buildup cycle.

As previously mentioned, all that is generally recommended is that the pressure be measured in the buildup cycle after sufficient data is acquired to determine an accurate curve fit.

Because the new technique makes use of all of the measured data, the pressure during the buildup cycle need not stabilize at the formation pressure. All that is generally recommended is that the pressure be measured in the buildup cycle until sufficient data is acquired to determine an accurate curve fit.

Thus Proett et al. ('286), in one embodiment, recites the use of "all of the measured data", recites the use of a "second, more accurate, drawdown/buildup cycle", and recites the determination of "an accurate curve fit"

In contrast, a preferred embodiment of the pending method of clam 1 ends the first buildup cycle by "holding constant the volume of the cavity immediately after detecting the occurrence of the break in the mud cake seal, for a sufficient build-up period to establish pressure equilibrium between cavity fluid and formation fluid", thereby mitigating flow line storage effects and so making measured pressure data (pressure at "pressure equilibrium between cavity fluid and formation fluid") usable.

So Proett et al. ('286) teaches away from the invention of pending method claim 1.

Applicants further note that Proett et al. ('286), in reciting the problem of flow line storage effects, appear to suggest that the pretest chamber has a fixed volume (5cc at column 8, line 13, or 20cc at column 8, line 20), that the pretest piston is drawn to the full length of its stroke at each drawdown, and that stopping the pretest piston, in Proett et al. ('286), is simply part of drawing the pretest piston to the full length of its stroke at each drawdown. (This process differs from the above-described Proett et al. process of stopping the pretest piston "when the pressure within the tester 10 has been sufficiently reduced to the drawdown pressure P_{dd}").

"Stopping the pretest piston" as part of "drawing the pretest piston to the full length of its stroke" at each drawdown (Proett et al. '286) does not equate to stopping the pretest piston "immediately after detecting the occurrence of the break in the mud cake seal", and is therefore insufficient to disclose or suggest "holding constant the volume of the cavity immediately after detecting the occurrence of the break in the mud cake seal", as recited in pending claim 1.

Stopping the pretest piston by drawing the pretest piston to the full length of its stroke is incompatible with "holding constant the volume of the cavity immediately after detecting the occurrence of the break in the mud cake seal", as recited in pending claim 1. The two steps are mutually exclusive.

So Proett et al. ('286) teaches away from the invention of pending method claim 1.

Therefore, because the cited references fail to disclose or suggest "holding constant the volume of the cavity immediately after detecting the occurrence of the break in the mud cake seal, for a sufficient build-up period to establish pressure equilibrium between cavity fluid and formation fluid", as recited in claim 1, and also teaches away from this part of claim 1, the Examiner's argument for rejection of claim 1 under 35 USC 103 is defective and should be withdrawn.

Applicants respectfully request that the Examiners rejection under 35 USC 103 of pending method claim 1 be withdrawn, and that claim 1 be passed to allowance.

3.2 Applicant's Response to Rejection of Claim 2 under 35 USC 103

The Examiner states, regarding claim 2, that Proett et al. ('076) disclose "where detecting the break in the mud cake seal includes measuring cavity pressure and detecting an abrupt change associated with cavity pressure (Column 2, lines 46-60)".

The Examiner further states, in part, that Proett et al. ('076) disclose "detecting an abrupt change associated with cavity pressure (Column 2, lines 46-60)".

Proett et al. ('076) at column 2, lines 46-60 teach as follows

> Fluid from the formation 222 is drawn into the tester 200 by mechanically retracting a pretest piston 218. The retracting of the pretest piston 218 creates a pressure drop at the probe 212, thereby drawing formation fluid into the probe 212, the flow lines 219, and a pretest chamber 220. The isolation pad 210 helps prevent borehole fluids 204 from flowing outward through the mudcake 206 and circling back into the probe 212 and the chamber 220. Thus, the isolation pad 210 "isolates" the probe 212 from the borehole fluids 204, helping to ensure that the measurements of the probe 212 are representative of the pressure in the formation 222. When the piston 218 stops retracting, formation fluid continues to enter

the probe 212 until the pressure differential between the chamber 220 and the formation 222 is minimized.

Applicants note that Proett et al. ('076) column 2, lines 46-60 make no mention of "detecting an abrupt change", and there is no mention of "an abrupt change associated with cavity pressure". Thus, the Examiner fails to show that Proett et al. disclose or suggest "detecting an abrupt change associated with cavity pressure".

Also, it is believed that claim 1 is in condition for allowance. Therefore claim 2 is in condition for allowance, as being dependent on claim 1.

Applicants respectfully request that the Examiners rejection under 35 USC 103 of pending method claim 2 be withdrawn, and that claim 2 be passed to allowance.

3.3 Applicant's Response to Rejection of Claims 7, 10 and 11 under 35 USC 103

The Examiner rejects claims 7, 10 and 11 under 35 U.S.C. 103(a) as being unpatentable over Proett et al. (5644076) in view of Proett et al. (5703286) and in further view of Desbrandes.

It is believed that claim 1 is in condition for allowance. Therefore claims 7, 10 and 11 are in condition for allowance, as being dependent on claim 1. Applicants respectfully request that the Examiner's rejection of claims 7, 10 and 11 be withdrawn, and that claims 7, 10 and 11 be passed to allowance.

3.4 Applicant's Response to Rejection of Claim 12 under 35 USC 103

The Examiner states, in part, regarding claim 12, that Proett et al. ('076) disclose "means for detecting an occurrence of a break in the mud cake seal. (Column 3, Figure 2B)".

In a preferred embodiment of the invention, control electronics 45 includes "means for detecting an occurrence of a break in the mud cake seal", and means for timing the stopping of the pretest piston to initiate "holding constant the volume of the cavity". Control electronics 45 stops the pretest piston "immediately after" an abrupt change associated with cavity pressure is detected.

Neither Proett et al. ('076) nor Proett et al. ('286) disclose or suggest control electronics having means for stopping of the pretest piston "immediately after" detecting an abrupt change associated with cavity pressure, i.e. "immediately after" detecting an occurrence of a break in the mud cake seal. So the Examiner's statement that Proett et al. ('076) disclose "means for detecting an occurrence of a break in the mud cake seal" is unfounded. Thus, the Examiner's argument for rejection of claim 12 under 35 USC 103 is defective because it fails to show that Proett et al. disclose or suggest control means including "b) means for detecting an occurrence of a break in the mud cake seal, and c) means for holding constant the volume of the cavity immediately after detecting the occurrence of the break in the mud cake seal, for a sufficient build-up period to establish pressure equilibrium between pretest cavity fluid and formation fluid", as recited in pending apparatus claim 12.

Applicants respectfully request that the Examiners rejection under 35 USC 103 of pending apparatus claim 12 be withdrawn, and that claim 12 be passed to allowance.

3.5 Applicant's Response to Rejection of Claim 13 under 35 USC 103

The Examiner rejects claim 13 under 35 U.S.C. 103(a) as being unpatentable over Proett et al. ('076) in view of Proett et al. ('286) and in further view of Proett et al. publication.

It is believed that claim 12 is in condition for allowance. Therefore claim 13 is in condition for allowance, as being dependent on claim 12.

3.6 Applicant's Response to Rejection of Claim 16 under 35 USC 103

The Examiner rejects claim 16 under 35 U.S.C. 103(a) as being unpatentable over Proett et al. ('076), in which Proett et al. disclose where the tool includes a constant volume flow line (Figure 2B).

It is believed that claim 12 is in condition for allowance. Therefore claim 16 is in condition for allowance, as being dependent on claim 12.

4.0 Applicant's Response to Objection to Claims 3-5, 8, 9, 14 and 17-22

The Examiner objects to claims 3-5, 8, 9, 14 and 17-22 as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

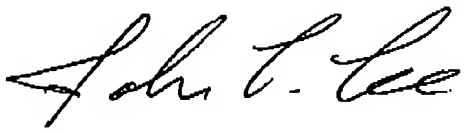
It is believed that independent claims 1 and 12 are both in condition for allowance, rendering the Examiner's objection moot. Applicants respectfully request that the Examiner's objection be withdrawn, and that claims 3-5, 8, 9, 14 and 17-22 be passed to allowance.

SUMMARY

Following reconsideration of the pending claims by the Examiner, it is believed that the application is in condition for allowance.

Consideration of the application and issuance of a notice of allowance is respectfully requested. It is believed that no extension of time is required. If additional fees are required for the timely consideration of this application, please charge deposit account no. 120914.

Respectfully submitted,



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